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R.G.

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/319,699	07/19/99	LIPPERT	G 990326

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EXAMINER

WILLE, D

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 06/15/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/319,699

Applicant(s)
Lippert et al.

Examiner
Douglas Wille

Group Art Unit
2814



☒ Responsive to communication(s) filed on Jun 9, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-13 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-13 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 5, 9, 10, 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Correction is required.
3. In claim 2, the upper limit for the dopant has an error. Claim 2 also refers to the epitaxial layer but it is not understood what epitaxial layer is meant.
4. Claim 5 shows dependence on one or more of the preceding claims but dependence can be in the alternative only.
5. Claim 9 states “..discontinuing germanium and dopant and vapor...”. This is not understood.
6. Claim 10 shows a letter c enclosed in a circle. Is this intended to be a capital c?
7. Claims 12 and 13 refer to the epitaxial layer but it is not understood what epitaxial layer is meant.

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Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 - 6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Lanzerotti et al. (IEEE).

10. With respect to claims 1 and 6 Lanzerotti et al. (IEEE) show (see Figure 3a) a HBT and a method of forming the HBT with a SiGeC base which is doped with B and has a C content of 0.5%. With respect to the relative change in the lattice, it is inherent in the C level.

11. With respect to claim 2, Lanzerotti et al. (IEEE) show that the use of C reduces strain in the base and the defect density is inherent in the structure. Figure 1 shows the B level as greater than $5(10)^{19}$.

12. With respect to claim 3, Lanzerotti et al. (IEEE) show the base layer is 46 nm but since criticality has not been established this is regarded as equivalent to 40 nm.

13. With respect to claim 4, the Ge concentration is 0.25.

14. With respect to claim 5, the SiGeC layer is grown and the shape is therefore rectangular.

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Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 7, 9 - 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lanzerotti et al.(IEEE) in view of Lanzerotti et al.(IEDM) and Hashimoto et al.

17. With respect to claims 7, 9 and 11, Lanzerotti et al. (IEDM) show that undoped SiGeC spacers suppress outdiffusion of B. Hashimoto shows the growth of a SiGe layer on SiC. Since Lanzerotti et al. shows the use of SiGeC spacers to prevent B diffusion it would have been obvious to use C doped collector and emitter layers to avoid having to grow the two extra spacer layers.

18. With respect to claim 10, it would have been obvious to use the same C concentration in all the layers to match that of the base layer.

19. With respect to claim 12, Lanzerotti et al. (IEEE) show CVD and with respect to claim 13, since MBE is a known technique which produces superior surface quality, it would have been obvious to use MBE as an alternative where the best surface quality is required.

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Conclusions

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.

21. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose number is (703) 308-0956.



Douglas A. Wille
Patent Examiner
Art Unit 2814

June 13, 2000